PHYTOTOXICOLOGY COMPLAINT INVESTIGATIONS OF LEAD CONCENTRATIONS IN SURFACE SOIL COLLECTED FROM RESIDENTIAL AND OTHER PROPERTIES IN THE VICINITY OF TONOLLI CANADA LTD., MISSISSAUGA - 1987

ARB-171-87-Phyto

DECEMBER 1987

Ontario
Ministry of the Environment

E. PICHÉ, Director
Air Resources Branch

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Phytotoxicology Complaint Investigations of Lead Concentrations in Surface Soil Collected from Residential and Other Properties in the Vicinity of Tonolli Canada Ltd., Mississauga - 1987

Phytotoxicology Section
Air Resources Branch

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Abstract

Fourteen of 183 properties sampled near Tonolli Canada Ltd. during May to July 1987 had one or more sites with greater than 500 micrograms per gram (ug/g) lead in the soil. Eleven of the 14 properties with above normal soil lead levels were in the general area of the Dixie Road/Queensway Avenue intersection. The highest soil level of 2,200 ug/g was found in a backyard lawn on Denise Road. Of the total number of properties sampled (183), two revealed a soil lead level of greater than 1,000 ug/g.

RÉSUMÉ

L'étude menée de mai à juillet 1987 portait sur 183 propriétés des environs de la société Tonolli Canada Ltd. À un ou plusieurs points d'échantillonnage de 14 d'entre elles, on a relevé des concentrations de plomb dans le sol supérieures à 500 microgrammes par gramme (ug/g). Onze des 14 propriétés en question se trouvent dans le secteur de l'intersection du chemin Dixie et de l'avenue Queensway. La concentration la plus élevée, soit 2 200 ug/g, a été décelée dans la pelouse d'un jardin du chemin Denise. Sur l'ensemble des 183 propriétés qui ont fait l'objet d'analyses, deux ont une concentration de plomb dans le sol supérieure à 1 000 ug/g.

Phytotoxicology Complaint Investigations of Lead Concentrations in Surface Soil Collected from Residential and Other Properties in the Vicinity of Tonolli Canada Ltd., Mississauga - 1987

Introduction

During May to July, 1987, staff of the Phytotoxicology Section collected surface soil samples from 183 properties (181 private residential properties, a school yard, and a vegetable field) in the vicinity of Tonolli Canada Ltd., Mississauga. The residential sampling was requested by area residents who were concerned that lead emissions from Tonolli had contaminated their properties. The vegetable field sampling was requested by the Peel Region Health Department to determine whether soil lead levels were acceptable for growing vegetable crops on a human health basis.

All but two of the residential properties sampled were situated throughout the residential area encompassed by Queensway Avenue (to N), Dixie Road (to W), QEW (to S), and Etobicoke Creek (to E), and were east of Dixie Road (see attached map). The two exceptions were situated in the neighbouring residential area west of Dixie Road. The residential sampling areas generally were southeast of Tonolli Canada Ltd. The school property was on Sherway Drive in the residential area east of Dixie Road. The vegetable field was situated off Tonolli Road and was west of the company.

Methods

Surface soil samples of 0 - 5 cm depth were collected from the lawn in the front yard and/or back yard (if accessible) on residential properties, as well as from the school playing field. On several residential properties, soil from vegetable gardens and/or flower bedding areas was collected to a 15 cm depth. On a few properties, including the school yard, soil from distinct children's play area(s) additionally was sampled. In the vegetable field, soil was sampled at usual tilled depth (0 - 15 cm). The sampling of each site (front lawn,

back lawn, garden, etc.) normally was duplicated. Lawns were sampled with a stainless steel soil corer while non-lawn sites (vegetable gardens, flower beds, sand boxes) normally were sampled with a small hand shovel. The samples were processed in the Phytotoxicology laboratory and were analyzed for lead by the MOE Laboratory Services Branch.

Results

Residential Properties

The analytical results attached show that of the 181 private residential properties sampled, 14 (7.7%) had one or more sampling sites with a soil lead level greater than 500 µg/g, the Phytotoxicology Section "upper limit of normal" lead level in urban surface soil. Of the total of 486 residential sites (front and back lawns - 350, gardens - 102, flower beds - 30, other - 4) sampled, 24 sites (4.9%) were found to have more than 500 µg/g lead in the soil, with 21 sites (on 11 properties) being in the general area of the intersection of Dixie Road and Queensway Avenue, south-east of Tonolli. Of the 14 properties with more than 500 µg/g lead at one or more sites, 9 were on Denise Road and 2 were on Venta Avenue, east of Dixie Road. The highest average soil lead level (2,200 µg/g) was detected in a backyard lawn on Denise Road, and only one other residential property, which also was on Denise Road, was found to have a soil lead concentration greater than 1,000 µg/g.

School Property and Vegetable Field

Soil lead levels detected in the school yard (24 - 240 µg/g) and in the vegetable field (120 - 155 µg/g) were well within a normal range (<500 µg/g) for urban surface soil.

Summary

In summary, 14 of 183 properties sampled near Tonolli Canada Ltd. during May to July, 1987 were found to have one or more soil sampling sites with an average lead level greater than the Phytotoxicology Section

"upper limit of normal" lead level (500 µg/g) for urban surface soil. Eleven properties (21 sites) of the 14 properties (24 sites) with "above-normal" soil lead levels (>500 µg/g) were in the general area of the Dixie Road - Queensway Avenue intersection. The highest soil level of 2,200 µg/g lead was found in a backyard lawn on Denise Road, east, south-east of Tonolli and bordering the Queensway. Of the total of 183 properties sampled, two revealed a soil lead level of greater than 1,000 µg/g.

RE1581

Lead Concentrations (ppm or µg/g, dry wt.) in Surface Soil Samples* Collected from Residential and Other Properties Near Tonolli Canada Ltd., Mississauga - 1987

STREET	AVERAGE RESULTS*		
	FRONT YARD	BACK YARD	OTHER
	Residential Properties		
Brentano Blvd.	lawn 175	lawn 255 garden 175	
Brentano Blvd.	lawn 66	lawn 64 garden 87	
Brentano Blvd.	lawn 81	lawn 84 garden 140	
Carletta Dr.	lawn 205	lawn 235 sand box 12	
Carletta Dr.	lawn 102	lawn 165 garden 77	
Carletta Dr.	lawn 102	lawn 110 garden 66	
Carletta Dr.	lawn 200	lawn 124	
Carletta Dr.	lawn 125	lawn 125 garden 52 sand box 10	
Carletta Dr.	lawn 175	lawn 165 garden 90	
Denise Rd.	lawn 210	lawn 185 bed 240	
Denise Rd.	lawn 210	lawn 130	
Denise Rd.	lawn 305 bed 80	lawn 140	
Denise Rd.	lawn 110	lawn 195	
Denise Rd.	lawn 245	lawn 97 bed 60	
Denise Rd.	lawn <u>645</u>	lawn 430	
Denise Rd.	lawn 160	lawn 220 bed 215	
Denise Rd.	lawn 250	lawn 220	
Denise Rd.	lawn 165	lawn 135 garden 61	
Denise Rd.	lawn 205	lawn 245 bed 150 sand box 4	
Denise Rd.	lawn 140	lawn 145 garden 105	

*Sampling depth was 0-5 cm for lawns; 0-15 cm for non-lawn (e.g. garden) sites.
*Concentrations exceeding the 500 µg/g "upper limit of normal" guideline are underlined.

TABLE (cont'd)

STREET	AVERAGE RESULTS		
	FRONT YARD	BACK YARD	OTHER
	Residential Properties		
Denise Rd.	lawn 190		
Denise Rd.	lawn 410	lawn 320 garden 255	
Denise Rd.	lawn 350		
Denise Rd.	lawn 355	lawn 390 garden 175	
Denise Rd.	lawn 490	lawn 425 garden 235	
Denise Rd.	lawn 540	lawn 490	
Denise Rd.	bed 66		
Denise Rd.	lawn 575	lawn 690	
Denise Rd.	lawn 240		
Denise Rd.	lawn 940	lawn 740	
Denise Rd.	lawn 990	lawn 1,050 bed 910	
Denise Rd.	lawn 445	lawn 2,200 garden 885	
Denise Rd.	lawn 330	lawn^{n} 220 lawn^{o} 715 garden^{o} 985	n - new soil o - original soil
Denise Rd.	lawn 830	lawn 680	
Denise Rd.	lawn 635	lawn 325	
Dixie Rd.	lawn 210	lawn 190 garden 125	
Dixie Rd.	lawn 125	lawn 125	
Dixie Rd.	lawn 200	lawn 125 garden 75	
Dixie Rd.	lawn 905 (S end) lawn 680 (N end)		side lawn 595 side garden 525
Family Cres.	lawn 155	lawn 145	
Family Cres.	lawn 180	lawn 210 bed 72	
Family Cres.	lawn 125	lawn 52 garden 71	
Family Cres.	lawn 155	lawn 155 garden 165	
Family Cres.	lawn 165	lawn 220 bed 160	
Family Cres.	lawn 145	lawn 34	
Family Cres.	lawn 160	lawn 135 garden 150	

TABLE (cont'd)

STREET	AVERAGE RESULTS		
	FRONT YARD	BACK YARD	OTHER
	Residential Properties		
Feldwood Rd.	lawn 110	lawn 225 garden 175	
Feldwood Rd.	lawn 160	lawn 235	
Feldwood Rd.	lawn 225	lawn 114 garden 110	
Feldwood Rd.	lawn 103	lawn 94	
Feldwood Rd.	lawn 140	lawn 185 bed 88	
Feldwood Rd.	lawn 97	lawn 88 garden 57	
Feldwood Rd.	lawn 140	lawn 105 garden 54	
Feldwood Rd.	lawn 265	lawn 255 garden 225	
Greenhurst Ave.	lawn 108		side lawn 105 side garden 76
Greenhurst Ave.	lawn 120	lawn 135 bed 85	
Greenhurst Ave.	lawn 205	lawn 65 bed 68	
Greenhurst Ave.	lawn 150	lawn 115 bed 130	
Greenhurst Ave.	lawn 140	lawn 145	
Greenhurst Ave.	lawn 160	lawn 175 garden 91	
Greenhurst Ave.	lawn 130	lawn 160	side bed 145
Greenhurst Ave.	lawn 130	lawn 180	
Greenhurst Ave.	lawn 120	lawn 150 garden 90	
Greenhurst Ave.	lawn 130	lawn 155 garden 87	
Greenhurst Ave.	lawn 135	lawn 99 bed 59	
Greenhurst Ave.	lawn 195	lawn 110	
Greenhurst Ave.	lawn 120	lawn 96 garden 44	
Greenhurst Ave.	lawn 110	lawn 86 garden 54	
Greenhurst Ave.	lawn 88	lawn 93 garden 60	

TABLE (cont'd)

STREET	AVERAGE RESULTS		
	FRONT YARD	BACK YARD	OTHER
	Residential Properties		
Greenhurst Ave.	lawn 180	lawn 70 bed 64	
Greenhurst Ave.	lawn 135	lawn 95	
Greenhurst Ave.	lawn 195	lawn 94	
Greenhurst Ave.	lawn 145	lawn 120 bed 84	
Greenhurst Ave.	lawn 64		
Greenhurst Ave.	lawn 105	lawn 105 bed 90	
Greenhurst Ave.	lawn 140	lawn 110	
Greenhurst Ave.	lawn 140	lawn 220 garden 130	
Greenhurst Ave.	lawn 205	lawn 52	
Greenhurst Ave.	lawn 115	lawn 92	
Greenhurst Ave.	lawn 150	lawn 105 bed 210	
Greenhurst Ave.	lawn 160	lawn 100 garden 88	
Greenhurst Ave.	lawn 57	lawn 66	
Greenhurst Ave.	lawn 160	lawn 115 garden 66	
Harvest Dr.	lawn 250	lawn 115 garden 67	
Kalligan Ct.	lawn 95	lawn 100	
Kalligan Ct.	lawn 105	lawn 105 garden 76	
Kalligan Ct.	lawn 73	lawn 98 garden 80	
Kalligan Ct.	lawn 100	lawn 71 bed 68	
Kalligan Ct.	lawn 92	lawn 99 bed 73	
Kalligan Ct.	lawn 160	lawn 61	side bed 70
Kalligan Ct.	lawn 125	lawn 55 garden 105	
Kalligan Ct.	lawn 115		
Kalligan Ct.	lawn 195	lawn 135 garden 62	
Kalligan Ct.	lawn 120	lawn 115 garden 84	
Kalligan Ct.	lawn 140	lawn 205 bed 125	

TABLE (cont'd)

STREET	AVERAGE RESULTS		
	FRONT YARD	BACK YARD	OTHER
	Residential Properties		
Laughton Ave.	lawn 92	lawn 155 garden 83	
Laughton Ave.	lawn 210	lawn 180 bed 115	
Laughton Ave.	lawn 185	garden 50	side lawn 180
Proverbs Dr.	lawn 155	lawn 94 garden 160	
Proverbs Dr.	lawn 140	lawn 155 garden 120	
Proverbs Dr.	lawn 255	lawn 370 garden 205	
Proverbs Dr.	lawn 170	lawn 210 garden 210	
Proverbs Dr.	lawn 305	lawn 295 garden 150	
Proverbs Dr.	lawn 240	lawn 260	
Proverbs Dr.	lawn 270	lawn 285 garden 160	
Proverbs Dr.	lawn 135	lawn 110 garden 140	
Proverbs Dr.	lawn 295	lawn 295 garden 490	
Proverbs Dr.	lawn 120	lawn 105	side bed 95
Proverbs Dr.	lawn 230	lawn 245 garden 260	
Proverbs Dr.	lawn 260		
Proverbs Dr.	lawn 155	lawn 130 garden 145	
Proverbs Dr.	lawn 240	lawn 92 garden 93	
Safeway Cres.	lawn 265	lawn 260 garden 580	
Safeway Cres.	lawn 325	lawn 355 garden 160	
Safeway Cres.	lawn 135	lawn 145 garden 89	
Safeway Cres.	lawn 265	lawn 345 garden 290	
Safeway Cres.	lawn 365	lawn 290 garden 430	
Safeway Cres.	lawn 375	lawn 445 garden 230	

TABLE (cont'd)

STREET	AVERAGE RESULTS		
	FRONT YARD	BACK YARD	OTHER
	Residential Properties		
Safeway Cres.	lawn 415	lawn 470	
Safeway Cres.	lawn 340	lawn 580	
Safeway Cres.	lawn 280	lawn 305 garden 250	
Safeway Cres.	lawn 355	lawn 395 garden 385	
Safeway Cres.	lawn 370	lawn 450 garden 315	
Safeway Cres.	lawn 385	lawn 420	
Safeway Cres.	lawn 250	lawn 345 bed 230	
Safeway Cres.	lawn 315	lawn 370 garden 345	
Safeway Cres.	lawn 260	lawn 365 garden 315	
Safeway Cres.	lawn 300	bed 145	
Safeway Cres.	lawn 210	lawn 200 garden 140	
Safeway Cres.	lawn 300	lawn 390 garden 220	
Safeway Cres.	lawn 125	lawn 155 garden 85	
Safeway Cres.	lawn 170	lawn 140	
Safeway Cres.	lawn 155	lawn 140 garden 120	
Sherway Dr.	lawn 125	lawn 175 garden 75	
Sherway Dr.	lawn 215	lawn 260 CPA 150 garden 180	(CPA - child play area)
Sherway Dr.	lawn 140	lawn 100 garden 140	
Sherway Dr.	lawn 155	lawn 185 garden 85	
Sherway Dr.	lawn 235		side lawn 200
Sherway Dr.	lawn 110	lawn 98 garden 72	
Sherway Dr.	lawn 170	lawn 175 garden 175	
Sherway Dr.	lawn 245		side lawn 140 garlic bed 140

TABLE (cont'd)

STREET	AVERAGE RESULTS		OTHER
	FRONT YARD	BACK YARD	
	Residential Properties		
Sherway Dr.	lawn 76	lawn 99 garden 150	
Sherway Dr.	lawn 58	lawn 31 bed 39	
Sherway Dr.	lawn 135	lawn 89 garden 110	
Sherway Dr.	lawn 47	lawn 75 garden 55	
Sherway Dr.	lawn 140	lawn 102	
Sherway Dr.	lawn 145	lawn 87 garden 135	
Sherway Dr.	lawn 135	lawn 95 garden 38	
Sherway Dr.	lawn 88	lawn 66 garden 65	
Sherway Dr.	lawn 42	lawn 38 garden 44	
Sherway Dr.	lawn 93		
Sherway Dr.	lawn 140	lawn 155 garden 135	
Sherway Dr.	lawn 98	lawn 93	
Sherway Dr.	lawn 70		
Sunnycove Dr.	lawn 210	lawn 175 garden 155	
Sunnycove Dr.	lawn 240	lawn 165 garden 155	
Sunnycove Dr.	lawn 205	lawn 180 garden 260	
Sunnycove Dr.	lawn 215	lawn 350 garden 290	
Sunnycove Dr.	lawn 165	lawn 220	
Sunnycove Dr.	lawn 350	lawn 340 garden 345	
Sunnycove Dr.	lawn 450		
Sunnycove Dr.	lawn 300	lawn 370 garden 295	
Sunnycove Dr.	lawn 175		
Sunnycove Dr.	lawn 220	lawn 165	
Sunnycove Dr.	lawn 150	lawn 155 garden 105	
Sunnycove Dr.	lawn 95		
Sunnycove Dr.	lawn 130	lawn 125	

TABLE (cont'd)

STREET.	AVERAGE RESULTS		
	FRONT YARD	BACK YARD	OTHER
	Residential Properties		
Sunnycove Dr.	lawn 150	lawn 71 garden 155	
Sunnycove Dr.	lawn 120	lawn 270 garden 280	
Sunnycove Dr.	lawn 88	lawn 190	
Sunnycove Dr.	lawn 110	lawn 110 garden 90	
Sunnycove Dr.	lawn 70		side lawn 91
Venta Ave.	lawn 190	lawn 240 garden 295	
Venta Ave.	lawn 190	lawn 190 garden 270	
Venta Ave.	lawn 79	lawn 220 garden 300	
Venta Ave.	lawn 295	lawn 530 garden 320	
Venta Ave.	lawn 385	lawn 160 garden 125 bed 38	
Venta Ave.	lawn 385	lawn 270 garden 125	
Venta Ave.	lawn 235	lawn 165 garden 115	
Venta Ave.	lawn 410	lawn 190 garden 165	
Venta Ave.	lawn 615	lawn 350 garden 190	

	SCHOOL PROPERTY	
Sherway Dr.	playing field	240
	slides area	35
	horse swings area	24
	VEGETABLE FIELD	
Tonolli Rd.	north end of field	135
	centre	120
	south end	155

NOTE: Phytotoxicology Section "upper limit of normal" lead concentration in urban surface soil (0 - 5 cm) is 500 µg/g.

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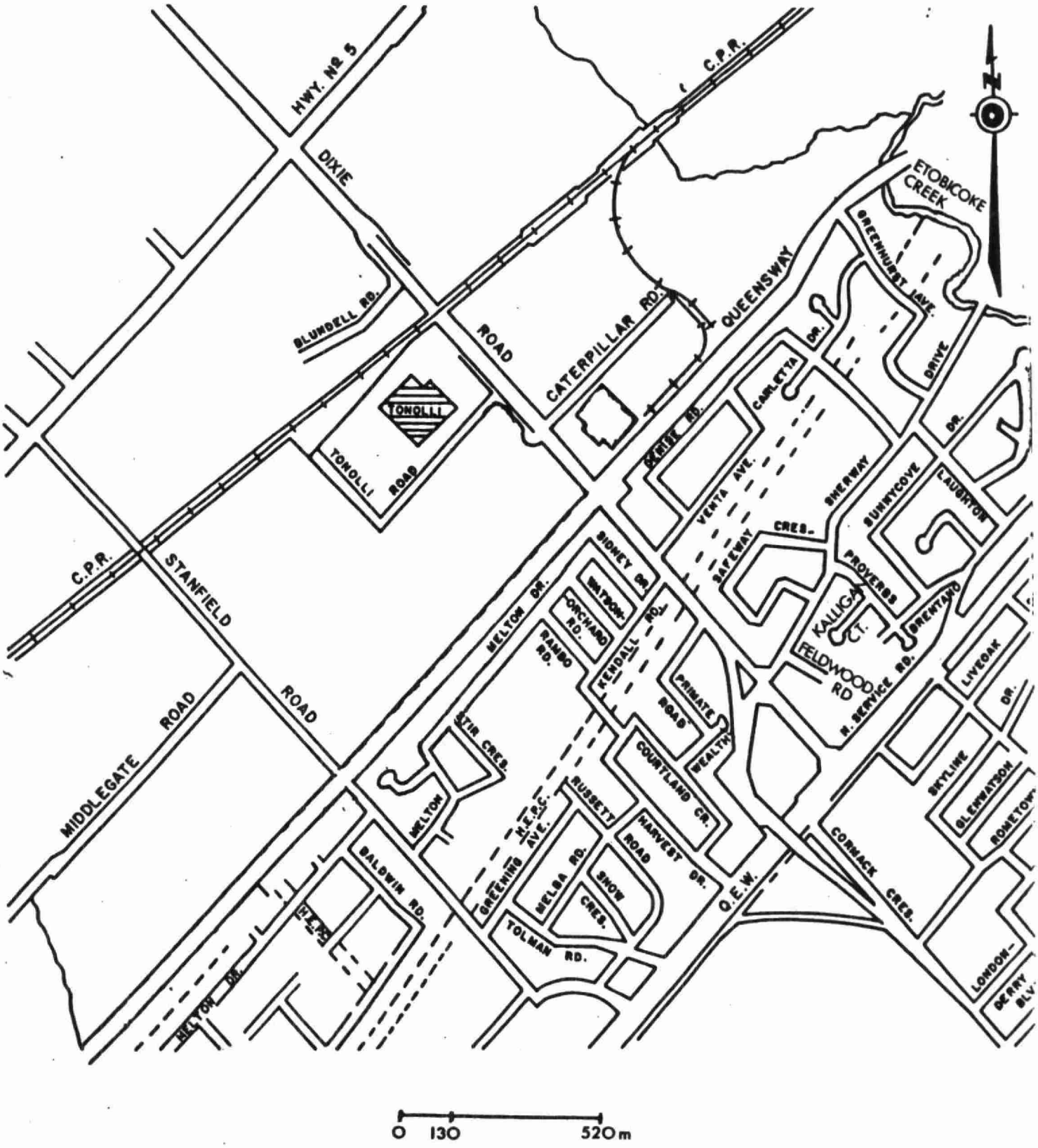
MAP OF STREETS IN THE VICINITY OF TONOLLI CANADA LTD., MISSISSAUGA.



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